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From the INTERNATIONAL BUREAU

To:

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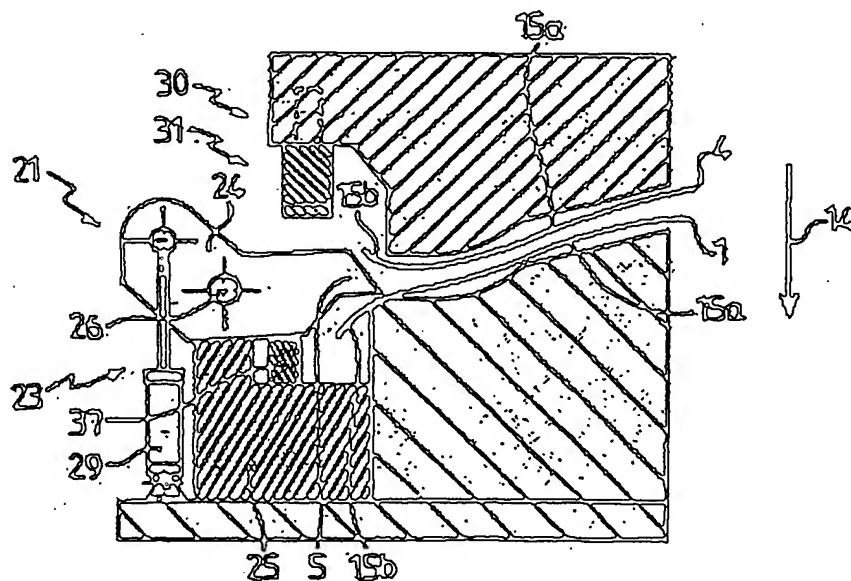
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(54) Title: SELECTIVE CUTTING "ONE SHOT"



(57) Abstract: The invention relates to a process and a device for forming a planiform piece intended, in particular, for the interior fittings of motor vehicles, in which a layer of support material (1) is covered, at least on one of its faces (2) and in the area of a portion (3), at least, of its contour, or so-called portion to be bordered, with a cladding sheet (4) and said support (1) is cut along said portion to be bordered (3) in such a way that said cladding (4) projects from said support (1) in the area of said portion. According to the invention, a cutting tool (5) is pre-positioned between said cladding (4) and said support (1) along said portion to be bordered (3) and said cutting is effected with said cutting tool (5), when the support (1) is covered by the cladding (4).

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SELECTIVE CUTTING "ONE SHOT"

Technical Field

The invention relates to a process and a device for forming a
5 planiform piece intended, in particular, for the interior fittings of motor vehicles.

Background

The expression "planiform piece" is to be taken as meaning a
piece the thickness of which is very considerably smaller than the other
10 dimensions, said piece not necessarily being flat, but possibly having inwardly
and/or outwardly facing deformations.

Although more especially intended for forming pieces designed
for the interior trim of the bodywork of motor vehicle passenger compartments
such as, for example, door panels, cabinet-work or dashboards, the invention
15 can also be used to form pieces intended for any other field.

There are presently known pieces constituted by a support
layer of fibrous material lined, on one of their faces, with a cladding sheet
which borders the support along its contour.

To obtain such pieces, the support of the cladding sheet is
20 formed, and then the support is cut out along its contour and the support is
covered in such a way that the cladding projects beyond said support so it can
then be tucked round.

It will be noted that such a process necessitates two
manufacturing stages, one to produce the support and the other to attach the
25 cladding sheet, which has an effect on the cost price.

Summary Of Invention

The aim of the present invention is to provided a process and a
device for forming a planiform piece, intended, in particular, for the interior
30 fittings of motor vehicles, that remedy the aforementioned drawbacks and
enable additional operations to be avoided.

Another object of the present invention is to provided a
process for forming a planiform piece, intended, in particular, for the interior

fittings of motor vehicles, that makes it possible to succeed in cutting the support while minimising the risks of flash or tearing.

A further aim of the present invention is to provide a process for forming a planiform piece intended, in particular, for the interior trim of motor vehicles that enables the cladding of the piece formed to be preserved.

Further aims and advantages of the invention will emerge in the course of the following description, which is given only by way of illustration and is not intended to limit same.

The invention relates firstly to a process for forming a planiform piece intended, in particular, for the interior fittings of motor vehicles, in which a layer of support material is covered, at least on one of its faces and in the area of a portion, at least, of its contour, or so-called portion to be bordered, with a cladding sheet and said support is cut along said portion to be bordered in such a way that said cladding projects from said support in the area of said portion, characterised by the fact that a cutting tool is pre-positioned between said cladding and said support along said portion to be bordered and said cutting is effected with said cutting tool, when the support is covered by the cladding.

The invention also relates to a device for forming a planiform piece intended, in particular, for the interior fittings of motor vehicles, including:

- means for covering a layer of support material, on at least one of its faces and in the area of a portion, at least, of its contour, or so-called 'portion to be bordered', with a cladding sheet, through the change over of said means for covering the support from a first configuration to a second configuration,
- means for cutting said support along said portion to be bordered in such a way that said cladding projects beyond said support in the area of said portion, said cutting means being constituted by a cutting tool, suitable for being positioned between said cladding and said support, along said portion to be bordered, and for permitting cutting when the means for covering the support change from their said first to their said second configuration.

Brief Description Of Drawings

The invention will be more readily understood from a study of the following description, accompanied by the annexed drawings, which form an integral part thereof, and wherein:

5 - Figs. 1a to 1c illustrate, in cross-section, the different steps in a first exemplary embodiment of the process according to the invention,

 - Figs. 2a to 2c illustrate, in cross-section, the different steps in a second exemplary embodiment of the process according to the invention,

 - Figs. 3a and 3c illustrate, in cross-section, the different steps in a third exemplary embodiment of the process according to the invention,

 - Figs. 4a to 4c, illustrate, in cross-section, a fourth exemplary embodiment of the process according to the invention,

 - Fig. 5 is an enlarged view of a portion, bearing the number 5 in the preceding figures, of an example of a piece obtained through the process according to the invention.

Detailed Description Of Invention

The invention relates firstly to a process for forming a planiform piece:

20 As illustrated in Figs. 1 to 4, according to the process of the invention, a layer of material, in particular fibrous material, defining a support 1 is covered by a cladding sheet 4 on at least one of its faces 2 and in the area of a portion 3; at least, of its contour, or so-called 'portion to be bordered'.

 Said support is intended, for example, to impart its form to the piece thus obtained, while cladding 4 serves, in particular, to enhance its appearance. The latter is constituted, for example, by a multi-layer material including, in particular, a thickness of non-woven fabric, a thickness of foam and a thickness of textile. Said cladding 4 is provided, for example, over the entire surface of said face 2 and/or over all of its contour.

30 Said support 1 is cut along said portion to be bordered 3 in such a way that said cladding 4 projects beyond said support 1 in the area of said portion 3.

 For this purpose, a cutting tool 5 is pre-positioned between

said cladding 4 and said support 1 along said portion to be bordered 3 and said cutting is carried out with said cutting tool 5 when support 1 is covered by cladding 4.

It will be noted that, according to the invention, selective cutting 5 is thus performed making it possible to avoid damaging the cladding and not to have to perform an additional operation on the piece in order to cut the support.

As illustrated in Fig. 5, there is obtained a piece 6 constituted by said support 1 and said cladding 4. The latter projects beyond said support 1 along said portion to be bordered 3 of its contour, in the area of a portion, bearing the number 7, which is thus available to be tucked round on the opposite face 8 of said support 1. The cut off portion, numbered 9, of the latter is discharged elsewhere.

This operation is conducted, for example in a mould 10 comprising a punch 11 and a die 12, defining between them an air gap 13. The latter has, for instance, the dimensions and/or the profile of the piece to be formed.

Said punch 11 and said die 12 are movable towards one another to enable the mould to be closed in a so-called 'forming' direction 14.

20 In said mould 10 said support 1 and said cladding 4, are positioned, for example, between said die 12 and said punch 11. Said support 1 and said cladding 4, placed facing one another in said forming direction, are each constituted by a first zone 15a, located in air gap 13, and by a second zone 15b, extending beyond said air gap 13.

25 Said second zone 15b of said support 1 is designed to constitute, for example, said cut off portion 9. It is provided, in particular, all along said portion to be bordered 3. The second zone 15b of said cladding 4 is intended to constitute, for example, projecting portion 7.

30 In said mould 10, said cutting tool 5 is also positioned, in the vicinity of the limit between said first zone 15a and said second zone 15b of said support 1 and/or of said cladding 4. Said cutting tool 5 is thus set in place as close as possible to said support 1 and/or said cladding 4.

Said support 1 and said cladding 4 are adhered to one another

by closing said mould, in said forming direction 14, said support 1 and said cladding 4 being possibly formed simultaneously, according to the profile given to air gap 13. For this purpose, thermocompression is used.

Cutting and closing of the mould can advantageously be coordinated by controlling the path of cutting tool 5 in relation to the relative path of die 12 and of punch 11 in such a way as to complete these two operations simultaneously. In other words, said cutting will be carried out at the end of the closing movement of mould 10 in said direction 14.

When the mould is closed said support 1 or said cladding 4 is held in position, for example by means of said cutting tool 5 against punch 11 or die 21, in the area of their said second zone 15b, so as to control their movement in the planes orthogonal to said forming direction 14.

More precisely, as illustrated in Figs. 1 to 3, said support 1 can be held in position against punch 11 by applying a cutting portion 16 of said cutting tool with controlled pressure against said punch 11 to obtain a sliding contact of said support between the latter. For cutting purposes, a pressure increment is then applied to said cutting portion 16 of said cutting tool 5. The positioning clearances of said support 1 are thus reduced.

To obtain said pressure increment, said punch 11 and/or said die 12 is/are moved towards one another, when the mould is closed, and the amount of movement of said punch 11 and/or of said die 12 originating from the closing of the mould is applied, for example, directly or indirectly to said cutting tool 5. It is thus unnecessary to have any other source of energy to activate the cutting tool.

It should be noted that the use of the amount of movement of punch 11 and/or of die 12 could also be contemplated without cutting tool 5 having previously been placed in contact with support 1.

As illustrated in Fig. 4, according to another form of embodiment, said cladding 4 is held in position against said die 12 by pinching between a non-cutting portion 17 of said cutting tool 5 and said die 12. A frame 40 can also be used. The energy for cutting is then imparted by a jack 18, acting, directly or indirectly, on said cutting tool 5 and secured to said die 12, after the closing of mould 10.

As illustrated in Figs. 2 and 3, said support 1 may possibly be wedged, in the area of the limit between said first zone 15a and said second zone 15b, against said punch 11, prior to cutting. According to other forms of embodiment, forming against die 12 can also be carried out.

5 By way of a non-limitative example, according to the different forms of embodiment illustrated, support 1 or cladding 4 is placed in air gap 13, said cutting tool 5 is then placed in contact with said support 1 or said cladding 4, and then cladding 4 or support 1, respectively, is inserted between cutting tool 5 and the other portion of the mould. The latter is then closed, which drives
10 said cutting tool 5, at the very least according to the exemplary embodiments of Figs. 1 to 3.

The invention also relates to a device for forming a planiform piece, in particular for implementing the process described above.

It includes means 19 for covering a layer of support material 1, on at least one of its faces 2 and in the area of a portion, at least, of its
15 contour, or so-called portion to be bordered 3, with a cladding sheet 4, through the changeover of said means 19 from a first configuration, the open position of mould 10, illustrated in Figs. 1a, 1b, 2a, 2b, 3a, 3b and 4a, 4b, to a second configuration, the closed position of mould 10, illustrated in Figs. 1c, 2c, 3c and
20 4c.

Said device also includes means 20 for cutting said support 1 along said portion to be bordered 3, in such a way that said cladding 4 projects beyond said support 1.

Said cutting means 20 are constituted by a cutting tool 5
25 capable of being positioned between said cladding 4 and said support 1, along said portion to be bordered 3, and of permitting cutting, when covering means 19 change over from their said first to their said second configuration.

Said means 19 for covering support 1 are constituted, for example, by a mould 10 comprising a punch 11 and a die 12 defining between
30 them an air gap 13. Said punch 11 and said die 12 are movable towards one another to enabling the mould 10 to close in a direction 14, or so-called forming direction.

Said support 1 and said cladding 4 can thus be adhered to one

another by closing said mould 10 in said forming direction 14.

Mould 10 further comprises, in particular, means 21 for positioning said support 1 and/or means 22 for positioning said cladding 4, capable of permitting their placing in such a way that said support and said
5 cladding are placed facing one another in said forming direction and are each constituted by a first zone 15a located in air gap 13 and by a second zone 15b extending beyond said air gap 13.

Said mould 10 further comprises means 23 for positioning said cutting tool 5, capable of permitting its placing in the vicinity of the limit
10 between said first zone 15a and said second zone 15b of said support 1 and/or said cladding 4.

As described more fully below, means 37 co-operate to permit the simultaneous completion of the cutting of support 1 by the cutting means and the closing of the mould.

15 Said means 21 for positioning support 1 or said means 22 for positioning cladding 4 are constituted, in particular, by said cutting tool 5. The latter can, in fact, possibly be capable of holding said support 1 or said cladding 4 in position, when the mould closes, against punch 11 or die 12, in the area of their said second zone 15b, so as to control their movement in
20 planes orthogonal to forming direction 14.

Said means 23 for positioning cutting tool 5 are constituted, for example, by a means 24 supporting said cutting tool and an intermediate member 25, in relation to which said cutting tool 5 is articulated, with said intermediate member 25 co-operating directly or otherwise with punch 11 or
25 die 12.

As illustrated in Figs. 1, 2 and 4, said means 24 supporting the cutting tool is articulated, for example, in rotation in relation to said intermediate member 25 about an axis 26. According to another form of embodiment, as illustrated in Figs. 3, this can also involve deflection in
30 translation in directions 27, 28 substantially parallel and/or orthogonal to said forming direction 14.

As illustrated in Figs. 1 and 2, said means 21 for positioning support 1 are constituted, for example, by said cutting tool 5, capable of

coming to bear against said punch 11 and said means 23 for positioning cutting tool 5 further include a jack, or ram, 29, acting on said means 24 supporting the cutting tool, so as to permit sliding contact of said support 1 between a cutting portion 16 of said cutting tool 5 and said punch 11. Said jack 5 29 of means 23 for positioning the cutting tool is secured, in particular, to said intermediate member 25.

Said mould 10 comprises means 30 for applying a pressure necessary for said cutting portion 16 of said cutting tool 5, for cutting purposes.

Advantageously, as illustrated in Figs. 1, punch 11, 10 intermediate member 25 and support 24 for cutting tool 5 are in direct contact with one another. Such a configuration facilitates heat exchange between them. Consequently, the expansion phenomena are distributed among each of them, which makes it possible to reduce uncertainty as to positioning.

This being the case, as illustrated in Figs. 1 to 3, the device 15 according to the invention can include, for cutting purposes, pressing means 31 to apply to said support 24 for cutting tool 5 and/or to said cutting tool 5 itself, the amount of movement of said punch 11 originating from the closing of mould 10. According to other forms of embodiment, not illustrated, this can involve, alternatively or cumulatively, the amount of movement of die 12.

20 As illustrated in Figs. 1 and 2, said pressing means 31 are constituted, for example, by stops 32, secured to said die 12 and extending towards punch 11, outside air gap 13, so as to be able to come to bear against support 24 for cutting tool 5 and/or cutting tool 5 itself, when the mould closes.

As illustrated in Fig. 3, said pressing means 31 can be 25 constituted, for instance, by a wedge or corner piece, 33 co-operating with an inclined plane 34 provided parallel on said support 24 of cutting tool 5, said wedge 33 being secured to said die 12 and said plane 34 being slightly inclined in relation to said forming direction 14.

It will be noted that, according to the different forms of 30 embodiment mentioned earlier, said means 30 for applying the pressure necessary for cutting and said pressing means 31 are possibly one and the same and act when said cutting tool 5 bears against said support 1, itself bearing on punch 11.

In Figs. 3, said wedge 33 even serves to position support 1 against punch 1 when the mould closes. More precisely, the movements of the cutting tool in direction 28 orthogonal to forming direction 14 are obtained by said wedge 33; through co-operation with said inclined plane 34, while their movements in direction 27 parallel to said forming direction 14 can be obtained using independent means.

According to other forms of embodiment, not illustrated, said pressing means 31 can be used without cutting tool 5 serving to position said support 1 against said punch 11.

As illustrated in Figs. 4, said means 22 for positioning cladding 4 are constituted, for example, by said cutting tool 5, which is intercalated between said cladding 4 and said support 1 and, being provided with a non-cutting zone 17, is capable of pinching said cladding 4 against said die 12. Said mould 10 is then provided with a jack 18, secured, in particular, to said die 12, to apply the force required for cutting to support 24 of said cutting tool 5 and, subsequently, to said cutting tool 5 itself.

Again in the same figures, as well as in Fig. 1, it will be noted that wedges 37, secured to support 24 of cutting tool 5 and/or to stop 32, can co-operate to complete the closing of the mould and the cutting operation simultaneously.

Means 38 are constituted, in particular, by elastic return means, located between a fixed point on the mould and support 24 of said cutting tool and/or said intermediate member 25, so as to restore it to the initial position.

According to the form of embodiment illustrated in Figs. 2, said elastic return means are located between said intermediate member 25 and a base 39 of mould 10. The elements of the assembly formed by support 24 of said cutting tool 5, said intermediate member 25 and said jack 29 acting on said support 24 for said cutting tool 5 are then movable in relation to said base 30.

In the case of a mould 10 intended to form a part having a portion 3 to be bordered on several of its sides, a said cutting tool 5, as well as said means 21, 22, 23 for positioning said support 1, said cladding 4 and said

cutting tool 5 are used in the area of each of the sides of the mould intended to receive said portion to be bordered 3. Several jacks 18, 29 can be provided along each of said sides to actuate said cutting tools 5 and/or their supports

24.

5

Other forms of embodiment, with the grasp of a person skilled in the art, could, of course, have been contemplated without thereby departing from the scope of the invention.

CLAIMS

1. A process for forming a planiform piece intended for an interior fitting of a motor vehicle, the process comprising:

5 covering at least one layer of at least one face (2) along a portion (3) of a support material (1) with a cladding (4);

cutting along said portion (3) such that said cladding (4) projects from said support material (1) in said portion (3);

pre-positioning a cutting tool (5) between said cladding (4) and said support material (1) along said portion (3); and

10 cutting along said portion (3) with said cutting tool (5) when said support material (1) is covered with said cladding (4).

2. The process according to claim 1 wherein a mould (10) comprising a punch (11) and a die (12) which define an air gap (13), and
15 wherein the punch (11) and the die (12) are movable towards one another to enable the mould to be closed in a forming direction (14), and

wherein said support (1) and said cladding (4) are positioned between said die (12) and said punch (11), said support (1) and said cladding (4), placed facing one another in said forming direction (14), each being
20 constituted by a first zone (15a), located in air gap (13), and by a second zone (15b), extending beyond said air gap (13), and

wherein said cutting tool (5) is positioned in a vicinity of a limit between said first zone (15a) and at least one of said second zone (15b) of said support (1) and of said cladding (4).

25

3. The process according to claim 2, wherein said support material (1) and said cladding (4) are adhered to one another by closing said mould (10) in said forming direction (14), and wherein said support material (1) and said cladding (4) are held in position using said cutting tool against at least
30 one of the punch (11) and the die (12), in an area of their said second zone (15b) so as to control their movement in planes orthogonal to said forming direction (14), when the mould closes.

4. The process according to claim 3, wherein said support (1) is held in position against the punch (11) during the closing of the mould by applying a cutting portion (16) of said cutting tool (5) with a controlled pressure against said punch (11), to obtain a sliding contact of said support (1) with said punch (11), and wherein a pressure increment is applied to said cutting portion (16) of said cutting tool (5).

5. The process according to claim 2, wherein at least one of said punch (11) and said die (12) are moved towards one another when the mould closes and the amount of movement of said punch (11) and of said die (12) originating from the closing of the mould is applied directly or indirectly to said cutting tool (5).

6. The process according to claim 2, in which the cutting and the closing of the mould are co-ordinated by controlling the path of the cutting tool in relation to the relative path of the die (12) and of the punch (11) in order to perform these two operations simultaneously.

7. The process according to claim 2, in which said support (1) is wedged in an area of a limit between said first zone (15a) and said second zone (15b); against at least one of said die (12) and said punch (11), prior to cutting.

8. A device for forming a planiform piece for an interior fitting of a motor vehicle, the device comprising:

a covering means (19) for covering a layer of support material (1), on at least one face (2) and in a portion (3) of said support material (1) with a cladding (4), wherein said covering means (19) changes from a first configuration to a second configuration;

a cutting means (20) for cutting said support material (1) along said portion (3) such that said cladding (4) projects beyond said support material (1) in said portion (3), and

wherein said cutting means (20) is adaptable for being

positioned between said cladding (4) and said support material (1), along said portion (3), and cutting said support material (1) along said portion (3) when the covering means (19) changes from said first to said second configuration.

5 9. The device according to claim 8, wherein said covering means (19) for covering said support (1) include a mould (10) having a punch (11) and a die (12), wherein an air gap (13) is defined between said punch (11) and said die (12) such that said punch (11) and said die (12) are movable towards one another to permit the closing of the mould in a forming direction

10 (14).
10. The device according to claim 9, wherein said mould (10) further comprises:

a first positioning means (21) for positioning said support (1);
a second positioning means (22) for positioning said cladding
15 (4); wherein said first and second positioning means position said support (1) and said cladding (4) facing one another in said forming direction (14) and wherein said support material (1) and said cladding (4) have a first zone (15a) located in said air gap (13) and a second zone (15b) projecting from said air gap (13); and
20 a third positioning means (23) for positioning a cutting tool (5) between said first zone (15a) and said second zone (15b) of said support material (1) and said cladding (4).

25 11. The device according to claim 10, wherein said first positioning means (21) and said second positioning means (22) is a cutting tool (5) configured to hold said support material (1) and cladding (4) in position against said punch (11) and said die (12), in said second zone (15b), so as to control movement in a plane orthogonal to said forming direction (14), when said mould closes.

30 12. The device according to claim 10, wherein said third positioning means (23) for positioning cutting tool (5) includes a support (24) articulated in relation to an intermediate member (25) for co-operating with at

least one of the punch (11) and the die (12).

13. The device according to claim 12, wherein:

5 said first positioning means (21) for positioning the support material (1) is a cutting tool (5) and is capable of coming to bear against said punch (11), and wherein said third positioning means (23) further includes a jack (29), acting on a cutting tool support (24) for applying a controlled pressure to a cutting portion (16) of said cutting tool (5) against said punch (11), to obtain a sliding contact of said support material (1); and

10 said mould (10) further include an applying means (30) for applying a pressure increment to said cutting portion (16) of said cutting tool (5).

14. The device according to claim 12, further comprising a pressing means (31) for applying to said support (24) of the cutting tool (5) and to said cutting tool (5) an amount of movement of said punch (11) and of said die (12) originating from the closing of the mould.

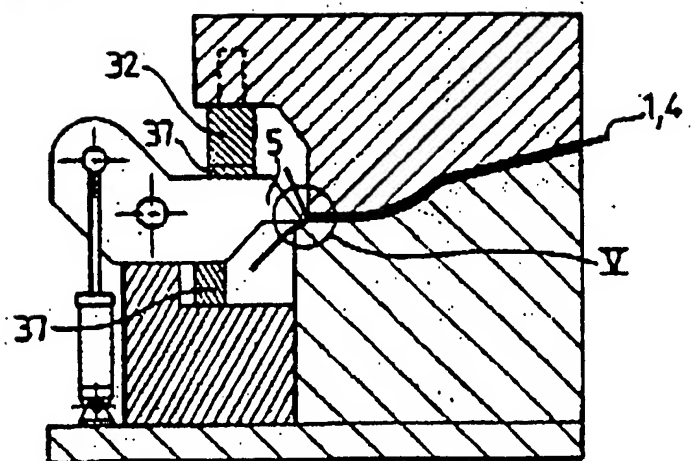
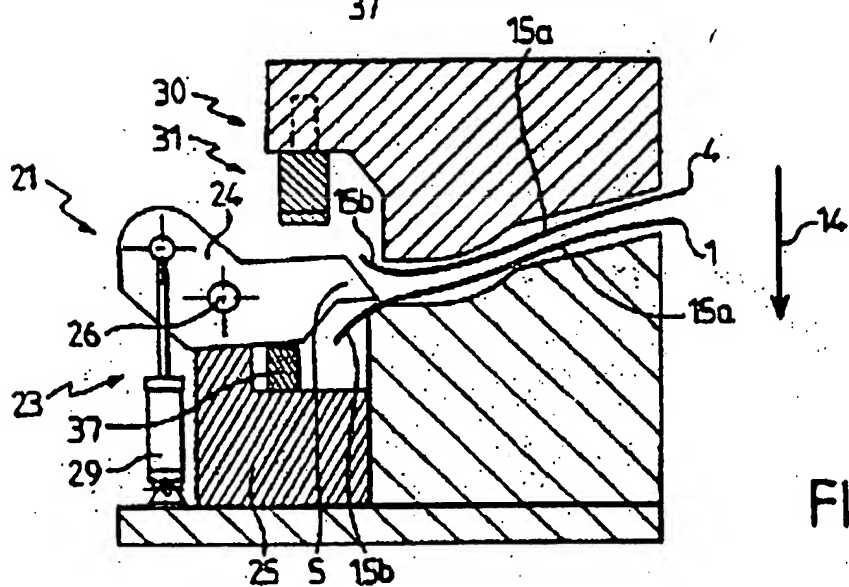
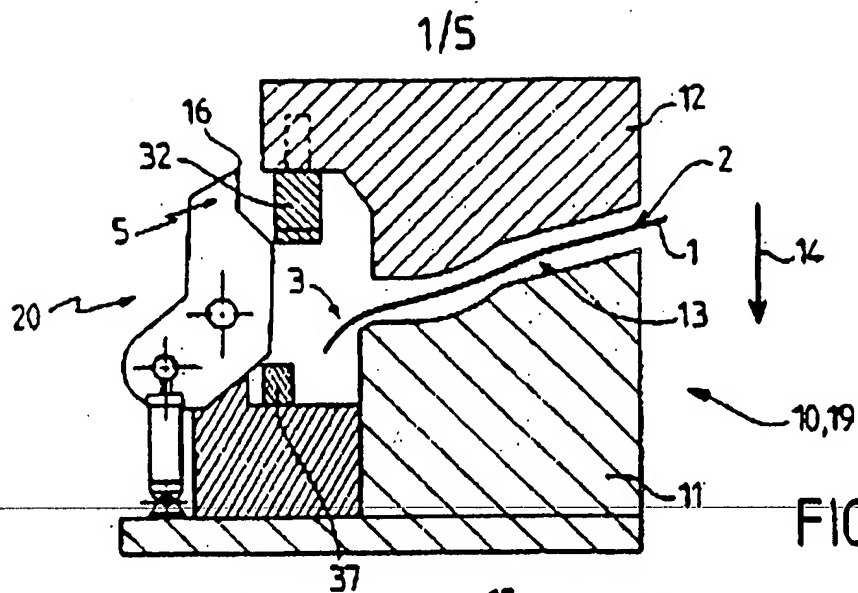
15 20 15. The device according to claim 14, wherein said pressing means (31) has a plurality of stops (32) secured to said die (12) and extending towards the punch (11), outside the air gap (13), so as to be able come to bear against at least one of the support (24) of said cutting tool (5) and the cutting tool (5) itself, when the mould closes.

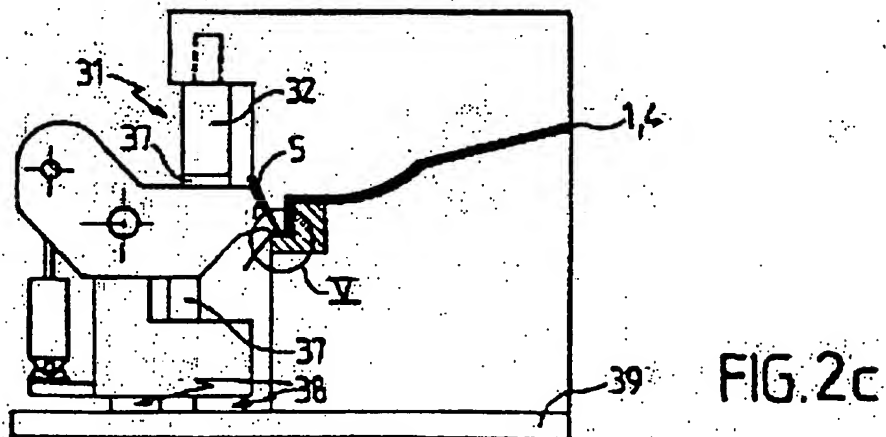
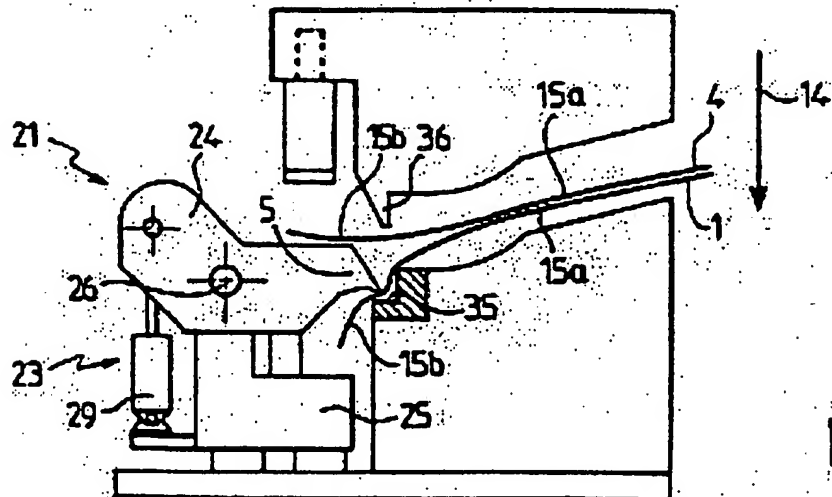
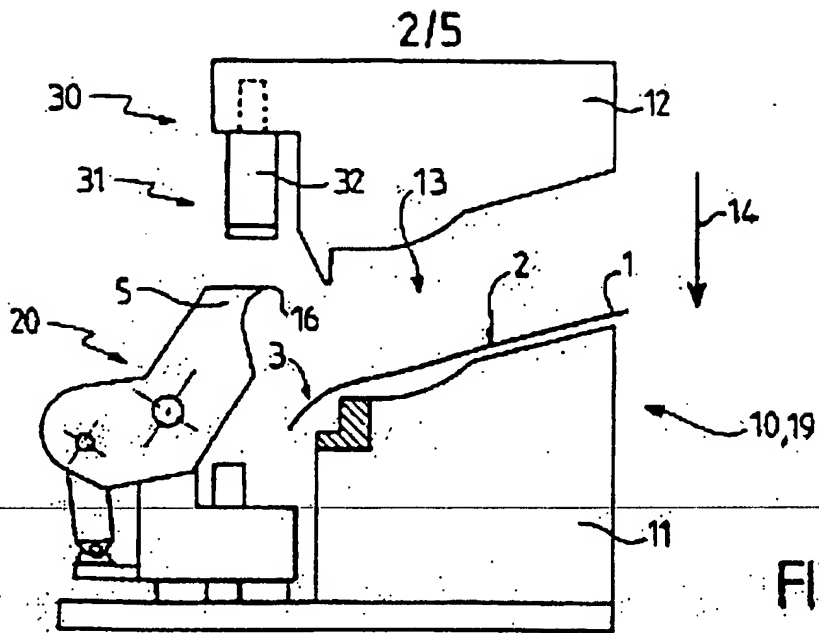
25 16. The device according to claim 14, further comprising wedges (37) secured to at least one of the support (24) of the cutting tool (5) and at least one of the plurality of stops (32), so as to control the path of the cutting tool to complete the closing of the mould and the cutting operation simultaneously.

30

17. The device according to claim 14, further comprising an elastic return means located between a fixed point on the mould (10) and at least one of the support (24) of said cutting tool (5) and said intermediate member (25), so as to restore the elastic return means to an initial position.

5





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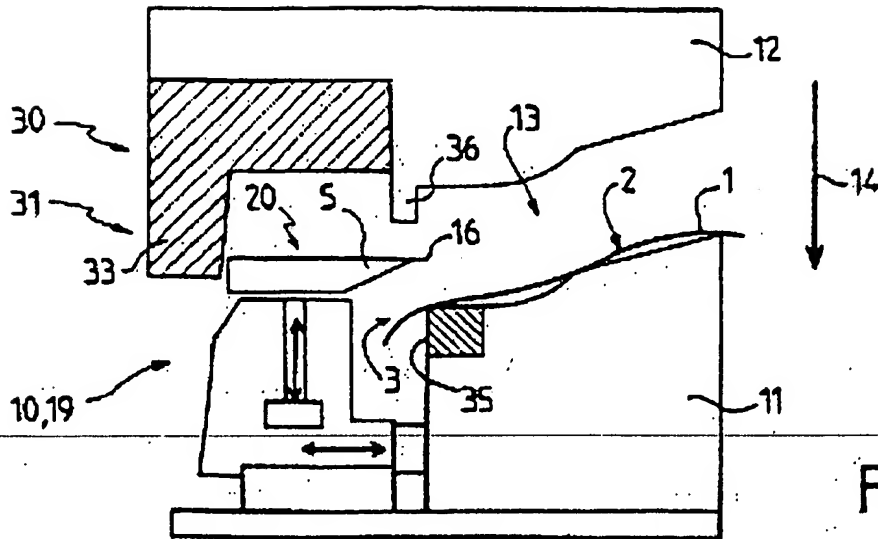


FIG. 3a

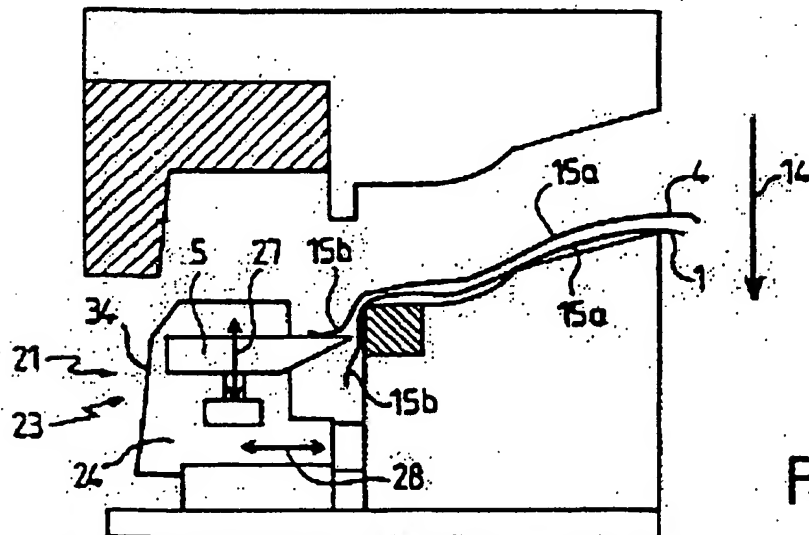


FIG. 3b

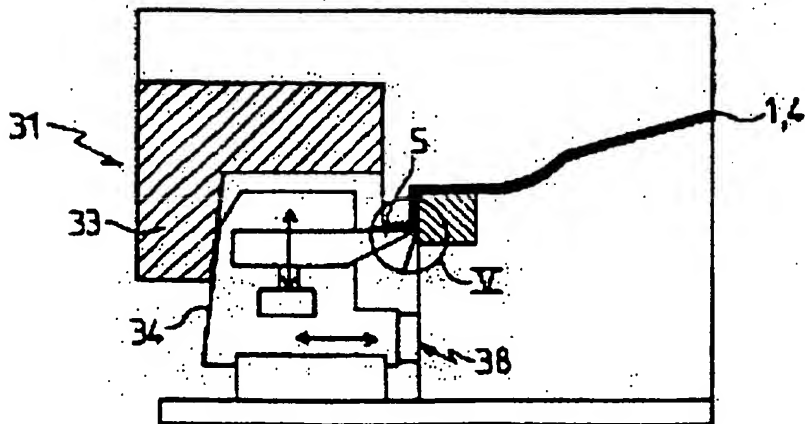
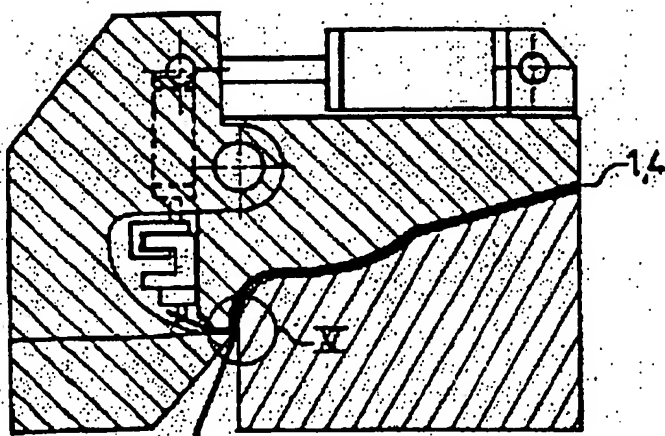
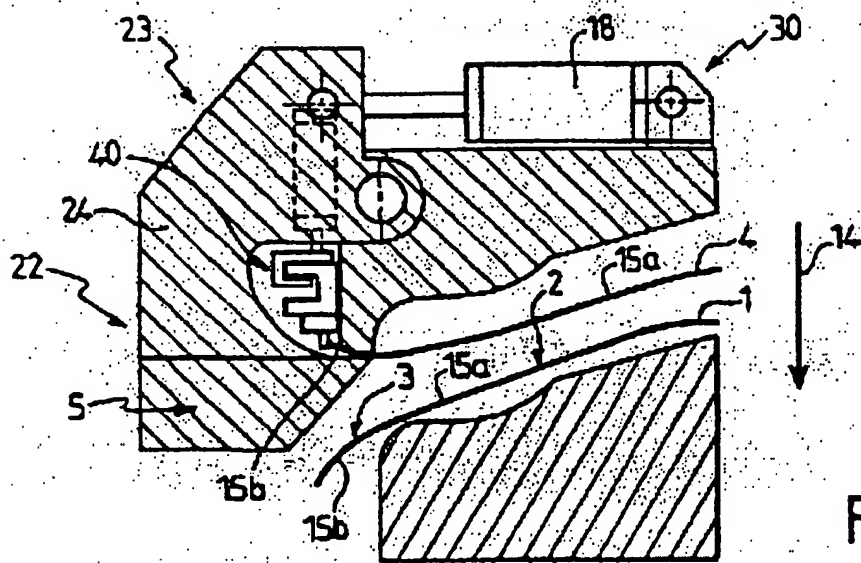
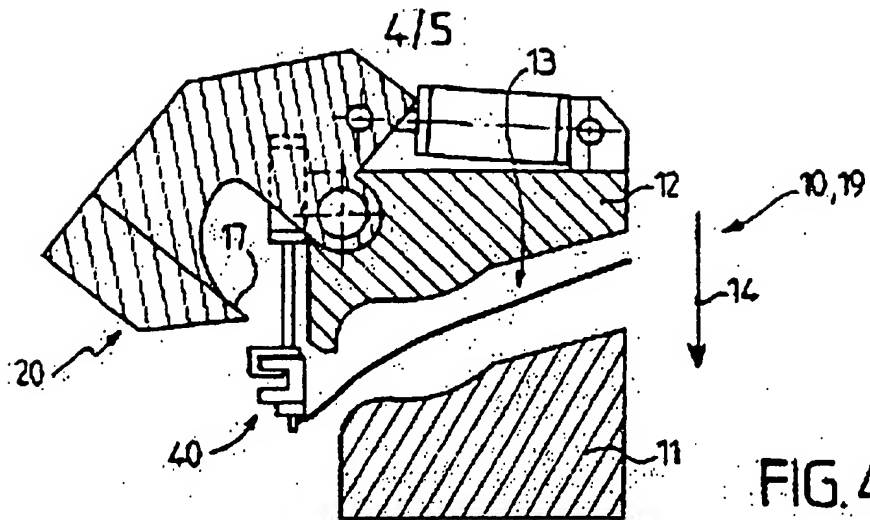


FIG. 3c



5/5

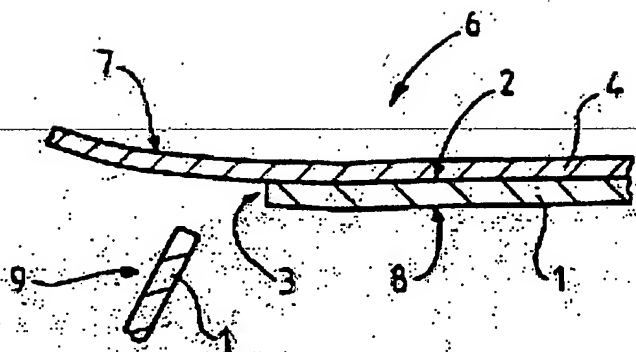


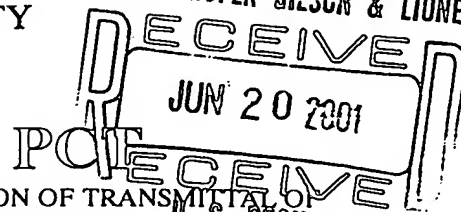
FIG. 5

PATENT COOPERATION TREATY

BRINKS HOFFER GILSON & LIONE

From the INTERNATIONAL SEARCHING AUTHORITY

To:
STEVEN L. OBERHOLTZER
BRINKS HOFFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60610



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of Mailing (day/month/year) 18 JUN 2001	
Applicant's or agent's file reference 10541-404	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US01/09105	International filing date (day/month/year) 22 March 2001 (22.03.2001)
Applicant VISTEON GLOBAL TECHNOLOGIES, INC.	

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompany sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Charles Goodman Telephone No. (703) 308-1148
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Form PCT/ISA/220 (July 1998)

Sheila Veney
Paralegal Specialist
Technology Center 3700

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 10541-404	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US01/09105	International filing date (<i>day/month/year</i>) 22 March 2001 (22.03.2001)	(Earliest) Priority Date (<i>day/month/year</i>) 22 March 2000 (22.03.2000)
Applicant VISTEON GLOBAL TECHNOLOGIES, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 1b



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/09105

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B29C 43/20

US CL : 156/254; 83/18, 175

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 156/254, 250, 261, 268; 83/18, 17, 19, 175, 176, 914, 922

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,622,667 A (FUJIYAMA et al) 22 April 1997 (22.04.1997), Figs. 1-6.	1-17
X	US 5,759,594 A (MASUI et al) 02 June 1998 (02.06.1998), Figs. 1-7.	1-17
X	US 4,991,478 A (RILEY) 12 February 1991 (12.02.1991), Fig. 2.	1-17
X, P	US 6,096,251 A (D'HOOREN) 01 August 2000, (01.08.2000), Figs. 2-5.	1-17
X	US 6,024,150 A (KAWAI et al) 15 February 2000 (15.02.2000), Figs. 6-8.	8
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Y		9-17
A	US 4,865,676 A (KIMURA et al) 12 September 1989 (12.09.1989), Figs. 3-20.	1-17

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

04 June 2001 (04.06.2001)

Date of mailing of the international search report

18 JUN 2001

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Charles Goodman

Telephone No. (703) 308-1148

Sheila V. Vanecko
Patent Specialist
Technology Center 3700

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/09105

Continuation of B. FIELDS SEARCHED Item 3: BRS

search terms: automobile, motor vehicle, cladding, trimming, punching

NOTES TO FORM PCT/ISA/220 (continued)

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

The statement should be brief, it should not exceed 500 words if in English or if translated into English.

It should not be confounded with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It should not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

In what language ?

The amendments must be made in the language in which the international application is published. The letter and any statement accompanying the amendments must be in the same language as the international application if that language is English or French; otherwise, it must be in English or French, at the choice of the applicant.

Consequence if a demand for international preliminary examination has already been filed ?

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase ?

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.